

Health Care Waste Management



Learning Objectives

1. Describe the various types of waste in health care.
2. Outline the sources that result in health-care waste.
3. Segregate the healthcare waste appropriately.
4. List the options for waste treatment.

Time involved

- 40 minutes



Key Points

- Sharps most likely health care waste to cause injury and/or exposure
- At a minimum, a waste management program must focus on sharps handling
- Proper segregation using available means will reduce the risk of disease transmission and minimise the amount of waste generated
- A range of treatment options for waste are available
 - Consideration should be given to those that reduce the opportunity for exposure and impact on the environment
- Education/training, support, supervision and regular reinforcement of practices are the keys to success



Introduction

- Proper management of health care waste creates a safer environment for staff, solid waste workers, and the public
- Health care waste management is dictated by
 - professional standards
 - local laws and national legislation
 - available resources



Types of Healthcare Waste

- Sharps waste
- Infectious waste
- Pathological waste
- Radioactive waste



Definitions - 1

Type of Waste	Definition	Examples
Sharps waste	Used or unused sharp items	Auto-disable syringes Broken glass Hypodermic, intravenous, or other needles Infusion sets Knives Pipettes Scalpels Syringes with attached needles
Infectious waste	Waste suspected to contain pathogens	Excreta Laboratory cultures Tissues (swabs), materials, or equipment that have been in contact with infected patients Waste contaminated with blood and other body fluids Waste from isolation wards

Definitions - 2

Type of Waste	Definition	Examples
Pathological waste	Pathological waste	Body parts Fetuses Human tissues, organs or fluids
Pharmaceutical waste, including cytotoxic waste	Pharmaceuticals that are expired or no longer needed	Cytotoxic waste containing substances with genotoxic properties, e.g., waste containing cytostatic drugs (often used in cancer therapy) Genotoxic chemicals Items contaminated by or containing pharmaceuticals
Non-risk general waste	Waste that does not pose a biological, chemical, radioactive, or physical hazard	Non-risk general waste

Definitions - 3

Type of Waste	Definition	Examples
Chemical waste	Waste containing chemical substances	Broken thermometers and blood-pressure gauges Disinfectants that are expired or no longer needed Film developer Laboratory reagents Pressurised containers Solvents Waste with high content of heavy metals, e.g., batteries
Radioactive waste	Waste containing radioactive substances	Contaminated glassware, packages, or absorbent paper Sealed sources Unused liquids from radiotherapy departments or laboratory research Urine and excreta from patients treated or tested with unsealed radionuclides

Sources - 1

	Sharps	Infectious and pathological waste	Chemical, pharmaceutical and cytotoxic waste	General waste
Medical ward	Hypodermic needles, intravenous set needles; broken vials and ampoules	Dressings, bandages, gauze, and cotton contaminated with blood or body fluids; gloves and masks contaminated with blood or body fluids	Broken thermometers and blood pressure gauges; spilt medicines; spent disinfectants	Packaging, food scraps, paper, flowers, empty saline bottles, non-bloody diapers; non-bloody intravenous tubing and bags
Operating theatre	Needles, intravenous sets, scalpels, blades, saws	Blood and other body fluids; suction canisters; gowns, gloves, masks, gauze, and other waste contaminated with blood and body fluids; tissues, organs, fetuses, body parts	Spent disinfectants	Packaging, uncontaminated gowns, gloves, masks, hats and shoe covers
Laboratory	Needles; broken glass, Petri dishes, slides and cover slips; broken pipettes	Blood and body fluids; microbiological cultures and stocks; tissue; infected animal carcasses; tubes and containers contaminated with blood or body fluid	Fixatives; formalin; xylene, toluene, methanol, methylene chloride, and other solvents; broken lab thermometers	Packaging; paper, plastic containers
Pharmacy			Expired drugs; spilled drugs	Packaging, paper, empty containers
Radiology			Silver; fixing and developing solutions; acetic acid; glutaraldehyde	Packaging, paper

Sources - 2

	Sharps	Infectious and pathological waste	Chemical, pharmaceutical and cytotoxic waste	General waste
Chemotherapy	Needles and syringes		Bulk chemotherapeutic waste; vials, gloves and other material contaminated with cytotoxic agents; contaminated excreta and urine	Packaging, paper
Environmental Services	Broken glass		Disinfectants (glutaraldehyde, phenols, etc.), cleaners, spilled mercury, pesticides	Packaging, flowers, newspapers, magazines, cardboard, plastic and glass containers, yard waste
Engineering			Cleaning solvents, oils, lubricants, thinners, asbestos, broken mercury devices, batteries	Packaging, construction or demolition waste, wood, metal
Food services				Food scraps; plastic, metal and glass containers; packaging
Physicians' offices	Needles and syringes, broken ampoules and vials	Cotton, gauze, dressing, gloves, masks and other materials contaminated with blood or other body fluids	Broken thermometers and blood pressure gauges; expired drugs; spent disinfectants	Packaging, office paper, newspapers, magazines, uncontaminated gloves and masks
Dental offices	Needles and syringes, broken ampoules	Cotton, gauze, gloves, masks and other materials contaminated with blood	Dental amalgam; spent disinfectants	Packaging, office paper, newspapers, magazines, uncontaminated gloves and masks
Home health care	Lancets and insulin injection needles	Bandages and other material contaminated with blood or other body fluids	Broken thermometers	Domestic waste



Collection

- Collect in containers that reduce the risk of exposure to users
- Label with the international biohazard symbol
- Do not overfill



Collection

- Segregate from regular garbage
- Place in special collection containers at the point of generation
 - keep separate from other waste
- Place labelled containers in areas where the specific waste is generated
 - along with containers for general garbage
- Non-infectious and non-hazardous waste should be disposed of with regular garbage, recycled, or composted, as appropriate



Collection Containers - 1

Type of Waste	Specifications for Container or Bag	Examples
<p>Sharps</p> 	<ul style="list-style-type: none"> • Container should be puncture-resistant, leak-proof on the sides and bottom, and durable. • Container should have the biohazard label. • Container should be closable for transport. 	<ul style="list-style-type: none"> • Empty bleach bottle with a biohazard label. • Thick, rigid, puncture-resistant cardboard box with a biohazard label. • Rigid plastic container with a biohazard label.
<p>Non-sharps biomedical solid and semi-liquid waste</p> 	<ul style="list-style-type: none"> • Plastic bag that is leak-proof; designed to prevent ripping, tearing, or bursting under normal use. The plastic bag should be placed inside a rigid container. • Rigid container should be leak-proof, durable, labeled with the biohazard symbol, and red or yellow in colour. 	<ul style="list-style-type: none"> • Red or yellow plastic bags should be used. • When coloured bags are not available, plastic bag with the biohazard label can be placed in a red or yellow-painted garbage can or dust bin.

Collection Containers - 2

Type of Waste	Specifications for Container or Bag	Examples
Non-sharps biomedical liquid waste	<ul style="list-style-type: none">• Container should be leak-proof and durable.• Container should be marked with the biohazard label if it will be used to transport waste.• Container should be designed to be transported without spillage.	<ul style="list-style-type: none">• Bottles, vials, plastic containers, canisters, pails marked with biohazard labels.

In-House Transport

- Waste transporters should wear gloves
- Cart for transporting healthcare waste within a facility should be fully enclosed
- Health care waste carts should not be used for regular garbage



Storage

- Minimise the impact of odours or putrescent waste
 - Do not store for more than 3 days
 - Putrescent waste should be transported to the landfill immediately and buried in special trenches
- Be accessible to authorised employees only and lockable to prevent unauthorised access
- Be protected from animals and not provide a breeding place or food source for insects and rodents
- Kept clean and free at all times of any loose debris and standing water
- Disinfect weekly and whenever a spill occurs

Treatment and Off-Site Transport

The World Health Organization does not recommend use of campfire-style open-pit burning, burning in a cement firebox, burning in drums, or open-burn cement-block incinerators, which should be discontinued



Incineration

- Small in-house incinerators, the local crematorium, and newer large-scale medical waste incinerators need to meet strict air pollution control requirements
- Where possible, should be replaced by cleaner, state-of-the-art non-burn treatment technologies



Waste Treatment and Disposal Options - 1

TYPE OF WASTE	Methods	Notes
All infectious wastes <i>Except</i> cultures and anatomical parts	Packaging, transport, and treatment by incineration or non-burn technology. When no technology is available, burial in special landfill trenches	This method should be used by large facilities (e.g., hospitals).
All infectious wastes <i>Except</i> cultures and anatomical parts	Small on-site burial pits	This method could be used in health centres away from coastal areas and local wells, in areas that do not flood, and where the water table is at least 1.5 metres deeper than the bottom of the pit.

Waste Treatment and Disposal Options - 2

TYPE OF WASTE	Methods	Notes
Cultures	Small on-site autoclaves or pressure cookers.	Preferably in the laboratory.
Anatomical parts	Interment at burial grounds or cemeteries.	This is the basic method for body parts.
Anatomical parts	Cremation.	? use a local crematorium.
Placenta waste And small-tissue waste	Small on-site burial pits or interment at burial grounds or cemeteries.	These are acceptable methods.
Placenta waste And small-tissue waste	Composting method.	This is an acceptable method.

Waste Treatment and Disposal Options - 3

TYPE OF WASTE	Methods	Notes
Free-flowing blood and body fluids	Sanitary sewer. When sanitary sewers are not available, known infectious blood and body fluids should be decontaminated with the addition of disinfectant such as sodium hypochlorite.	This method applies to all health facilities with sanitary sewers.

Transport

- Waste contained in sealed plastic bags and/or sharps containers
- Place in hard corrugated cardboard boxes or reusable plastic bins for transport every few days (sooner for putrescent waste) or whenever sufficient waste has accumulated
- Containers have biohazard labels or are colour coded
 - e.g., red or yellow or as dictated by local legislation



Management

Waste management should be incorporated into policies, procedures, and programmes to minimise the risk of spreading infection in and from the health care facility, thereby protecting patients, healthcare workers, and the public

Training

- Initial training emphasise safe healthcare waste management practices
- Practical training provided to all those involved in handling, packaging, transporting, and disposing of health care waste.



References

- Healthcare waste, World Health Organization
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- MedWaste Treatment – Minimizing Harm, Maximizing Health 2003. Health Care without Harm.
<http://www.bvsde.paho.org/bvsacd/cd43/mer.pdf>
- UN Global Environmental Fund (GEF) Global Healthcare Waste Project. <http://www.gefmedwaste.org>
- World Health Organization: Safe Injection Global Network.
http://www.who.int/medical_devices/collaborations/network/en/



Quiz

1. The majority of hazardous healthcare waste includes the following types:
 - a. Sharps and Infectious
 - b. Infectious and Pathological
 - c. Chemical and Infectious
 - d. Infectious and Pharmaceutical
2. Waste containers must:
 - a. Have a biohazard label
 - b. Not be overfilled
 - c. Not pose a risk
 - d. All of the above
3. The type of treatment for healthcare waste depends primarily on:
 - a. Economic resources
 - b. Transportation options
 - c. Available landfills
 - d. All of the above

International Federation of Infection Control

- IFIC's mission is to facilitate international networking in order to improve the prevention and control of healthcare associated infections worldwide. It is an umbrella organisation of societies and associations of healthcare professionals in infection control and related fields across the globe .
- The goal of IFIC is to minimise the risk of infection within healthcare settings through development of a network of infection control organisations for communication, consensus building, education and sharing expertise.
- For more information go to <http://theific.org/>

